CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 89-57

SITE CLEANUP REQUIREMENTS AND RECISION OF ORDER NO. 88-015 FOR:

TRW, INC., FEI MICROWAVE, INC., AND TECH FACILITY 1, INC.
825 STEWART DRIVE
SUNNYVALE
SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter called the Board) finds that:

1. Location and Facility Description The 825 Stewart Drive facility is located in Sunnyvale near the intersection of the Lawrence Expressway and Route 101. This is an area of Santa Clara Valley of low topographic relief. The drainage in the area is toward the north to San Francisco Bay.

   The facility is located in an industrial park setting dominated by low buildings separated by paved parking lots, fields and streets, with some landscaping. The dominant activity in this area is related to the semiconductor industry, though the area is bordered by residential property.

2. Regulatory Status TRW, Inc., FEI Microwave, Inc. and Tech Facility 1, Inc. are hereinafter referred to as dischargers because of the releases of hazardous wastes that have occurred at this site. The site was purchased by TRW Microwave in 1974 and was occupied by TRW Microwave from July 1974 to August 1986. TRW, Inc., the parent corporation for TRW Microwave, has agreed to assume full responsibility to complete all necessary investigations and remedial action programs related to the subject property. Tech Facility 1, Inc. is the current owner of the property and FEI Microwave, Inc. is the current operator of the facility. All three parties are named as dischargers; however, Tech Facility 1, Inc. and FEI Microwave Inc. have responsibility for plume investigation and cleanup only in the event that TRW fails to comply with investigation and cleanup provisions of the Order.

   TRW is also a Responsible Party under the Federal Superfund (CERCLA/SARA) and 825 Stewart Drive is a site proposed for inclusion on the National Priorities List (NPL). This Order is intended to outline the tasks required for completion of the Remedial Investigation/Feasibility Study (RI/FS) as required by CERCLA/SARA.

3. Site History Initial operation as an industrial facility began in 1968 when Aertech Industries began assembling and testing microwave components at this site. The first semiconductor manufacturing began in 1970. The site was purchased by TRW Microwave in 1974 and was occupied by TRW Microwave from July 1974 to August 1986. The property was purchased by Tech Facility 1, Inc. in 1987. Some assets at this site were acquired by FEI Microwave, Inc. in July 1987. The manufacturing facility is currently operated by FEI Microwave, Inc.

While processes have varied throughout the history of the site, chemical usage has remained relatively constant. Solvents, metals, and acids have been involved in the manufacturing process.

Initial investigation of pollution at the 825 Stewart Drive site began in 1983 at the request of Board Staff. The initial phase of investigation produced evidence of soil pollution with a variety of volatile organic chemicals (VOC's). Additional soil work was completed in 1983 and initial groundwater investigation began in July 1983. In addition to VOC's, metals were detected in soil near the acid neutralization system. A more comprehensive soil investigation was completed in 1988 to address possible polluted soil that might still remain near the identified point sources.

All underground storage and treatment systems for solvents and acids have been removed and replaced with above ground systems.

Following initial investigations and actions at this site the initial Board Order, a Clean Up and Abatement Order was adopted in 1984 and Waste Discharge Requirements were adopted in 1985. New Waste Discharge Requirements for the existing NPDES Permit, which expires in September 1989, will be addressed at a later date.

4. Hydrogeology The sediments present at the TRW site were deposited by streams that deposited sediment from the uplands to the south as they flowed north toward what is now San Francisco Bay. The materials present in the subsurface are interbedded sands, silts and clays. The finer grained materials are probably dominant with the more permeable, coarser grained units tending to be laterally discontinuous.

The static groundwater flow direction at 825 Stewart Drive is to the north-northeast in all aquifers. The flow direction and vertical hydraulic gradient may be reversed locally in the vicinity of groundwater extraction wells operating in the A,

B1 and B2 aquifers.

Six local groundwater aquifers have been identified at the TRW (FEI) facility. Regional investigation has indicated that deeper aquifers do exist in the Santa Clara Valley groundwater basin and are probably present in the project area. The shallowest water bearing zone has been designated the A zone and generally occurs from 6 to 25 feet below the ground surface. This is the most persistent, permeable unit near 825 Stewart Drive and generally contains from 1 to 19 feet of permeable material. The next unit has been designated as the B1 aquifer and generally occurs from 25 to 55 feet below ground surface and contains 0.5 to 15 feet of permeable materials. The next unit has been designated as the B2 aquifer and occurs from 45 to 55 feet below the ground surface. It generally contains from 6 to 8 feet of permeable material. The next unit, the B3, is relatively thin and only encountered in a few borings at the TRW site. It consists of from 1 to 5 feet of permeable material. The next unit, B4, begins from 82 to 86 below ground surface and contains 1 to 4 feet of permeable material. The deepest unit identified at the TRW site is aquifer B5. This aquifer occurs from 116 to 123 feet below ground surface and contains 5 to 7 feet of permeable material.

5. Soil Pollution Initial soil pollution investigations focused on the area near the underground solvent waste storage tank in 1983. Additional soil samples were collected in July of 1983; the soil in these samples contained a variety of VOC's including trichloroethylene (TCE), tetrachloroethylene (PCE), and 1,2-dichloroethylene (1,2-DCE). The waste solvent storage tank and some associated soil was removed in 1983. Additional soil removal was completed in 1984. The excavation was expanded to the limits allowed by the proximity of the building. This area was identified as a point source for chemicals that resulted in groundwater pollution.

   Additional investigation was completed in 1988, as required in the previous Order, since some contaminated soil was left in place near the former location of the underground waste solvent storage tank.

   Soil investigation near an underground, acid neutralization system was also carried out during the closure of the system in 1986. Some soil samples contained elevated levels of metals, however no elevated levels of VOC's were detected during this investigation. This area is not considered a source area for pollutants currently detected in the groundwater, however additional investigation of groundwater pollution by metals will be required.

6. Groundwater Quality The initial groundwater monitor wells

6. Groundwater Quality The initial groundwater monitor wells were installed at this site by TRW in 1983, with additional wells installed in 1984 and 1986. The dominant VOC in the groundwater is TCE, although 1,2-DCE, Freon 113, and PCE are also frequently detected.

   The highest initial levels of TCE in the groundwater were detected in well T-2A. The highest concentrations of VOC's in the A aquifer in 1988 continued to be measured in groundwater from well T-2A, with the most recent concentration being 1300 µg/l. Groundwater pollution in the deeper aquifers was originally the most concentrated in well T-2B. Currently the highest TCE concentration in onsite wells is in well T-10C in aquifer B2, with a concentration of 12,000 µg/l.

7. Relationship To Other Sites The offsite remediation efforts are conducted in conjunction with Signetics and Advanced Micro Devices (AMD). The workplan for additional work required for the completion of a Remedial Investigation and Feasibility Study (RI/FS), and the RI/FS, are being completed as a joint project by AMD, Signetics, and TRW, Inc. (hereinafter the Companies).

   A proposed final workplan, which includes separate onsite tasks for each company and joint offsite tasks, was submitted on behalf of the Companies in July 1988 and a revised workplan was submitted February 6, 1989. Adoption of this Order approves this workplan, as revised, and the tasks outlined for completion of a joint RI/FS. It is anticipated that final remedial actions and offsite remedial actions will also be proposed as a joint effort of all three companies.

8. Chemicals Of Concern Chemicals detected in water and soil include trichloroethylene (TCE), trichloroethane (TCA), tetrachloroethylene (PCE), and Freon 113. TCE is the chemical most commonly present and serves as an indicator chemical for this site, AMD 901/902, and Signetics. Some priority pollutant metals have been detected in soil at TRW. Further investigation of the possible significance of these inorganics will be required.

9. Interim Remedial Actions, Soil Interim actions to deal with soil pollution began in 1983 with the removal of the underground waste solvent storage tank and some associated polluted soil. Additional soil was removed from this same area in 1984. All the polluted soil could not be removed due to the proximity of the foundation of the 825 Stewart building to the excavation.

investigation were 4 mg/kg total VOC's. Levels of VOC's found in the saturated zone were as a high as 34 mg/kg.

Investigation in the area of underground acid neutralization system and its associated piping system was completed in 1985 and 1986. No VOC's were detected in either area, however some areas of possible metals pollution were located.

10. Interim Remedial Actions, Onsite Groundwater Initial actions to deal with groundwater pollution at the 825 Stewart Drive site began in 1984 with the installation of an eductor in the waste solvent tank excavation. Additional extraction wells were created in 1984 by the conversion of some existing monitoring wells.

Groundwater extraction currently involves seven extraction wells, three A zone wells, three B1 aquifer wells, and one B2 extraction well. Due to the depressed water table little water has been extracted from the waste solvent tank excavation by the eductor since 1987 and one A aquifer well has operated infrequently.

The extracted groundwater is treated by an air stripping system at the 825 Stewart site. After treatment the water is released to surface waters under NPDES Permit Number CA0028886.

11. Interim Remedial Actions, Offsite Groundwater Two offsite groundwater containment extraction systems have been installed. The Duane Avenue Extraction system, consisting of nine extraction wells, is located just south of Duane Avenue, approximately 1200 to 2100 feet downgradient (north) of the AMD, Signetics, and TRW operable units. This extraction system was installed and began operation in 1986. The Duane Avenue system extracts water from the A, B1, B2, B3 and B4 aquifers.

A second extraction system consisting of fourteen wells, along Alvarado Avenue, approximately 2700 to 4300 feet downgradient (north) of the AMD, Signetics And TRW operable units, was completed in 1988. Operation of the Alvarado Avenue system began in October 1988. This system extracts water from the A, B1, and B2 aquifers. Data has been collected for the evaluation of both extraction systems and a report evaluating the effectiveness of the systems was submitted on March 10, 1989.

The extracted groundwater is transferred by a piping system to AMD's 915 DeGuigne facility where the water is treated. About 80 % of the treated water is utilized as process make-up water by the AMD 915 facility and the remainder is released to surface water under NPDES Permit Number CA0028797.

12. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on December 17, 1986. The Basin Plan contains water quality objectives and beneficial uses for South San Francisco Bay and contiguous surface and ground waters.

13. The existing and potential beneficial uses of the groundwater underlying and adjacent to the facility include:

    a. Industrial process water supply
    b. Industrial service water supply
    c. Municipal and Domestic water supply
    d. Agricultural water supply

14. The discharger has caused or permitted, and threatens to cause or permit waste to be discharged or deposited where it is or probably will be discharged to waters of the State and creates or threatens to create a condition of pollution or nuisance.

15. This action is an order to enforce the laws and regulations administered by the Board. This action is categorically exempt from the provisions of the CEQA pursuant to Section 15321 of the Resources Agency Guidelines.

16. Onsite and offsite interim containment and cleanup measures need to be continued to alleviate the threat to the environment posed by the continued migration of pollutants and to provide a substantive technical basis for designing and evaluating the effectiveness of final cleanup alternatives.

17. The Board has notified the discharger and interested agencies and persons of its intent under California Water Code Section 13304 to prescribe Site Cleanup Requirements for the discharge and has provided them with the opportunity for a public hearing and an opportunity to submit their written views and recommendations.

18. The Board, in a public meeting on April 19, 1989, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that the discharger shall cleanup and abate the effects described in the above findings as follows:

A. <u>PROHIBITIONS</u>

1. The discharge of wastes or hazardous materials in a manner which will degrade water quality or adversely affect the beneficial uses of the waters of the State is prohibited.

2. Further significant migration of pollutants through subsurface transport to waters of the State is prohibited.

3. Activities associated with the subsurface investigation and cleanup which will cause significant adverse migration of pollutants are prohibited.

B. **SPECIFICATIONS**

1. The storage, handling, treatment or disposal of soil or groundwater containing pollutants shall not create a nuisance as defined in Section 13050(m) of the California Water Code.

2. The discharger shall conduct monitoring activities as outlined in the revised sampling plan dated October 27, 1987, or as revised later, to define the current local hydrogeologic conditions, and the lateral and vertical extent of soil and groundwater pollution. Should monitoring results show evidence of pollutant migration, additional characterization of pollutant extent may be required. Within sixty (60) days of the Executive Officer's determination and actual notice to Tech Facility 1, Inc. and FEI Microwave, Inc. that TRW, Inc. has failed to comply with this paragraph, Tech Facility 1, Inc., and FEI Microwave, Inc., as landowner and operator, shall comply with this specification.

C. **PROVISIONS**

1. The discharger shall submit to the Board acceptable monitoring program reports containing results of work performed according to a program as described in the October 1987 sampling plan, or as amended, and approved by the Executive Officer.

2. The discharger shall comply with Prohibitions A.1., A.2., and A.3., and Specifications B.1. and B.2. above, in accordance with the following time schedule and tasks:

COMPLETION DATE/TASK

ON-SITE

a) COMPLETION DATE: June 15, 1989

TASK: AMENDED SAMPLING PLAN: Submit an addendum to the Sampling Plan to included sampling of selected wells to

analyze for EPA priority pollutant metals, an initial sampling of selected wells for analysis by EPA method 8240 (open scan) and inclusion of future groundwater sampling events with analysis by appropriate EPA 8000 series analytical method.

b) COMPLETION DATE: July 17, 1989

TASK: SOIL REMEDIATION: Submit a technical report proposing soil remediation alternatives for the polluted soil in the vicinity of the former waste solvent storage tank and the acid neutralization system or justification for why the polluted soil does not represent a threat to water quality and any pilot or treatability studies proposed for the polluted soil.

OFFSITE

c) COMPLETION DATE: June 1, 1989

TASK: ADMINISTRATIVE RECORD: Submit a proposal acceptable to the Executive Officer to compile and index an Administrative Record as outlined in EPA Interim Draft Guidance on Administrative Records for Selection Of CERCLA Response Actions.

d) COMPLETION DATE: February 17, 1990

TASK: REMEDIAL INVESTIGATION Submit a technical report acceptable to the Executive Officer pursuant to the work plan described in Finding 7 as revised, and approved by the Executive Officer, containing the results of the remedial investigation including complete site characterization (both onsite and offsite), and an evaluation of the installed interim remedial measures.

e) COMPLETION DATE: April 17, 1990

TASK: FEASIBILITY STUDY AND REMEDIAL ACTION PLAN: Submit a technical report acceptable to the Executive Officer pursuant to the work plan described in Finding 7 as revised, and approved by the Executive Officer, containing the results of a feasibility study evaluating alternative final remedial measures. The feasibility study should include an evaluation of alternative methods of disposing of extracted and treated groundwater. This evaluation should compare reuse, reinjection and disposal to the sanitary sewer to the current system of release of treated groundwater to

surface water through NPDES Permit Number CA0028886. This evaluation shall include a projection of the cost, effectiveness, and benefit of alternative disposal options. In addition, submit a Remedial Action Plan, as a separate technical report containing 1) recommended measures necessary to achieve final cleanup objectives; and 2) the time schedule necessary to implement the recommended final remedial measures.

3. All Technical reports submitted must be acceptable to the Executive Officer. The submittal of technical reports evaluating interim and final remedial measures shall include a projection of the cost, effectiveness, benefits, and impact on public health and the environment.

4. The remedial investigation and feasibility study shall consider the guidance provided by Subpart F of the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300); Section 25356.1 (c) of the California Health and Safety Code; CERCLA guidance documents with reference to Remedial Investigation, Feasibility Studies, and Removal Actions; and the State Water Resources Control Board's Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California".

5. If the discharger is delayed, interrupted or prevented from meeting one or more of the completion dates specified in this Order, the discharger shall notify the Executive Officer prior to the deadline for the completion date.

6. Technical reports summarizing status of compliance with the Prohibitions, Specifications, and Provisions of this Order and progress on completion tasks as identified in the workplan as revised, shall be submitted on a quarterly basis, according to the schedule below, commencing with the report for the second quarter 1989, due July 31, 1989.

Quarter	1st quarter	2nd Quarter	3rd Quarter	4th Quarter
Period	Jan-March	April-June	July-Sept	Oct-Dec
Due Date	April 30	July 31	October 31	January 31

The quarterly reports shall include;

a. a summary of work completed since the previous quarterly report,
b. appropriately scaled and labeled maps showing the location of all monitoring wells, extraction wells,

and existing structures,

c. updated water table and piezometric surface maps for all affected water bearing zones, and isoconcentration maps for key pollutants in all affected water bearing zones, shall be included at a minimum in the reports for the second and fourth quarters, or in the event of significant changes,

d. a summary tabulation of all well construction data, groundwater levels and chemical analysis results for site monitor wells specified in the sampling plan,

e. a summary tabulation of volume of extracted groundwater and chemical analysis for all site groundwater extraction wells,

f. identification of potential problems which will cause or threaten to cause noncompliance with this Order and what actions are being taken or planned to prevent these obstacles from resulting in noncompliance with this Order, and

g. in the event of noncompliance with the Provisions and specifications of this Order, the report shall include written justification for noncompliance and proposed actions to achieve compliance.

7. All hydrogeological plans, specifications, reports, and documents shall be signed by or stamped with the seal of a registered geologist, engineering geologist or professional engineer.

8. All samples shall be analyzed by State certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain Quality Assurance/Quality Control records for Board review.

9. The discharger shall maintain in good working order, and operate, as efficiently as possible, any facility or control system installed to achieve compliance with the requirements of this Order.

10. Copies of all correspondence, reports, and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order, shall be provided to the following agencies:

a. Santa Clara Valley Water District
b. Santa Clara County Health Department
c. City of Sunnyvale
d. State Department of Health Services/TSCD
e. U. S. EPA Region IX
f. U. S. EPA Region IX Contractor, as identified by Region IX personnel

The Executive Officer may additionally require copies of correspondence, reports and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order to be provided to a local repository for public use.

11. The discharger shall permit the Board or its authorized representative, in accordance with Section 13267(c) of the California Water Code:

    a. Entry upon premises in which any pollution sources exist, or may potentially exist, or in which any required records are kept, which are relevant to this Order.

    b. Access to copy any records required to be kept under the terms and conditions of this Order.

    c. Inspection of any monitoring equipment or methodology implemented in response to this Order.

    d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.

12. The discharger shall file a report on any changes in site occupancy and ownership associated with the facility described in this Order.

13. If any hazardous substance is discharged to any waters of the state, or discharged and deposited where it is, or probably will be discharged to any waters of the state, the discharger shall report such discharge to this Regional Board, at (415) 464-1255 on weekdays during office hours from 8 a.m. to 5 p.m., and to the Office of Emergency Services at (800) 852-7550 during non-business hours. A written report shall be filed with the Regional Board within five (5) working days and shall contain information relative to: the nature of waste or pollutant, quantity involved, duration of incident, cause of spill, Spill Prevention, Control, and Countermeasure Plan (SPCC) in effect, if any, estimated size of affected area, nature of effect, corrective measures that have been taken or planned, and a schedule of these activities, and persons/agencies notified.

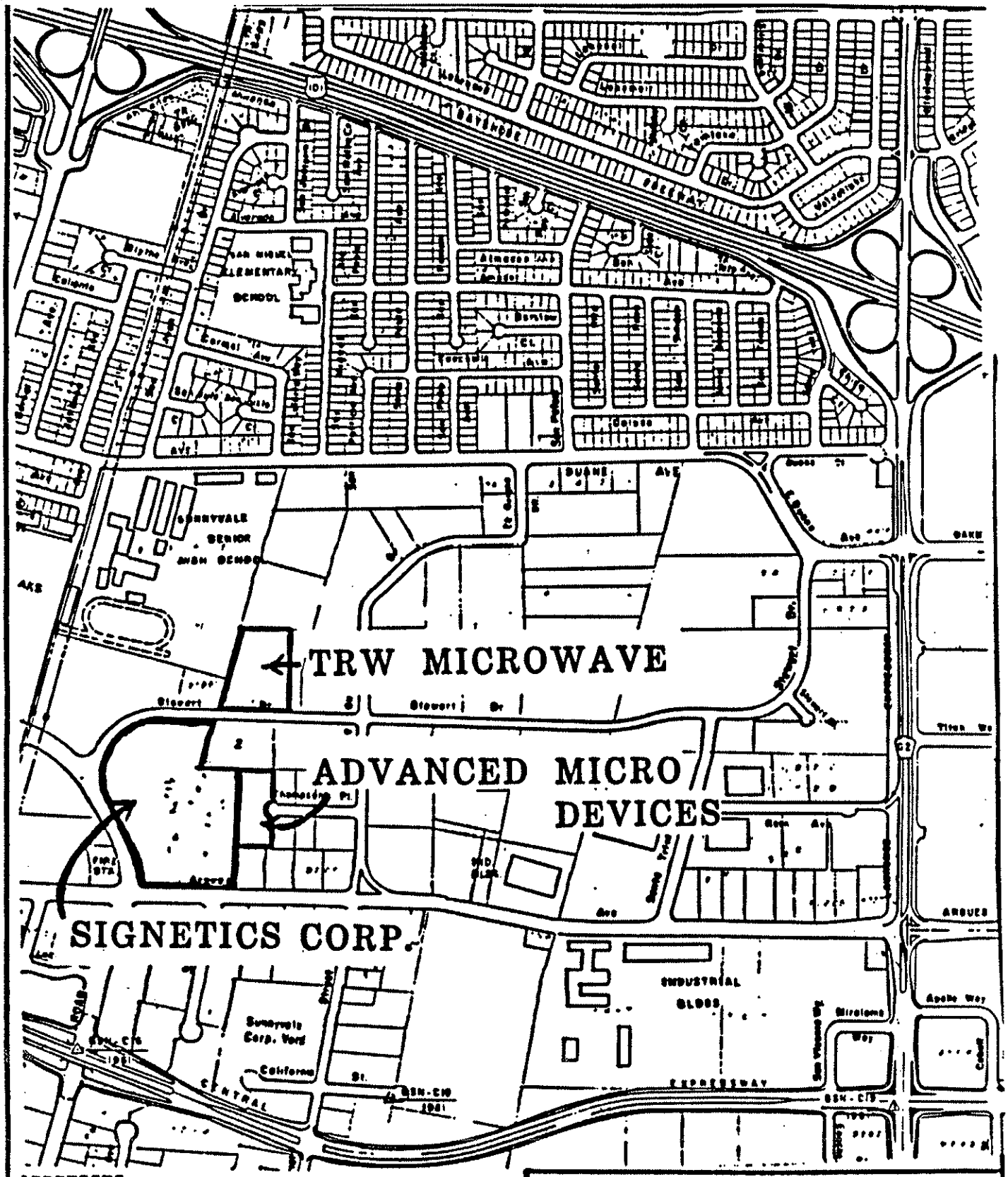
14. The Board will review this Order periodically and may revise the requirements when necessary.

I, Steven R. Ritchie Executive Officer, do hereby certify that the

foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on April 19, 1989.

Steven R. Ritchie
Executive Officer

Attachments: Site location map



ADDRESSES:

---TRW Microwave Inc.,
825 Stewart Drive, Sunnyvale

---Advanced Micro Devices Inc.,
901 Thompson Place, Sunnyvale

---Signetics Corporation
811 E. Arques Avenue, Sunnyvale

STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

LOCATION MAP:

Advanced Micro Devices Inc.,Sunnyvale
Signetics Corporation, Sunnyvale
TRW Microwave Inc., Sunnyvale

DRAWN BY:	DATE: 2/2/87	DRWG NO.